



Leptodictyum wallacei (Musci: Amblystegiaceae), a New Species
from Texas, U.S.A.

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ABSTRACT. A new aquatic moss from Hext Spring, Texas, is described as *Leptodictyum wallacei*. The new species is distinct in the genus by its small plant size, stiff stem aspect, long leaf cells, firm-walled basal cells, and undifferentiated alar cells.

Key words: Amblystegiaceae, aquatic moss, *Leptodictyum*, Texas.

The southern interior region of the United States (southern Missouri, Arkansas, eastern Oklahoma, and central Texas) is an area of numerous limestone springs. These springs are often fast-running and have cold, clear water. Associated with these springs are a number of interesting mosses such as *Hygroamblystegium noterophilum* (Sullivant & Lesquereux) Warnstorf, *Brachythecium rivulare* Schimper, *Donrichardsia macroneuron* (Grout) Crum & L. E. Anderson, *Fissidens grandifrons* Bridel, *Fontinalis duriaei* Schimper, and the curious *laxirete*-form of *Leptodictyum riparium* (Hedwig) Warnstorf. Recently Brad Wallace collected an interesting moss he found in large masses submerged in Hext Spring, a limestone spring in San Saba County, Texas. He sent it to us for identification, and after careful observation we recognized it as a new species of *Leptodictyum* (Schimper) Warnstorf.

Leptodictyum wallacei B. H. Allen & Magill, sp. nov. TYPE: U.S.A. Texas: San Saba Co., Hext Spring, 4 mi. W of Cherokee, off Ranch Road 501, USGS Magill Mountain quad map, 30°58'49"N, 098°46'22"W, 1555 ft. elev., 13 Dec. 2003, Brad Wallace s.n. (holotype, MO; isotypes, BM, DUKE, FH, H, MICH, NY, PC, S, US). Figure 1.

Species haec a *Leptodictyo ripario* plantis rigidis, marginibus foliorum serrulatis, costis latioribus, foliis valde tortilibus ubi siccis pilisque axillaribus rubris differt.

Plants slender in green to yellow-green, dense masses of long, stiff, sparingly branched strands; stems stiff, irregularly branched, in cross section with sclerodermis of 4 to 5 rows of small, yellow or reddish, thick-walled cells, cortical cells enlarged, yellowish to hyaline, firm-walled, small central strand present; paraphyllia absent; pseudoparaphyllia foliose; rhizoids not seen; axillary hairs 3- to 5-celled, lower 1 to 2 cells irregularly quadrate, upper cells rectangular to cylindrical, all cells red. Leaves erect-spreading and individually strongly twisted when dry, erect when wet, evenly spaced, 2.0–2.5 mm long, lanceolate, smooth, long-acuminate to a broad, blunt tip, concave, not decurrent; margins plane to erect, obscurely serrulate to subentire; costae single, broad, to 70 μm wide at base, extending $\frac{3}{4}$ the leaf length, in cross section cells \pm homogeneous, thick-walled; laminal cells linear-rhomboidal to vermicular, firm-walled, upper cells to 70 \times 6 μm , median leaf cells to 120 \times 6 μm , cells near leaf insertions long-rectangular, firm-walled, at margins cells often subquadrate, alar cells not differentiated. Perichaetial and perigonia not seen. Sporophytes not seen.

Leptodictyum wallacei is a slender moss that grows in large, permanently submerged masses in Hext Spring, Texas. Since the plants grew submerged, it is not possible to determine the orientation of the stems, i.e., whether the primary stems typically grow horizontally or erect, and there is

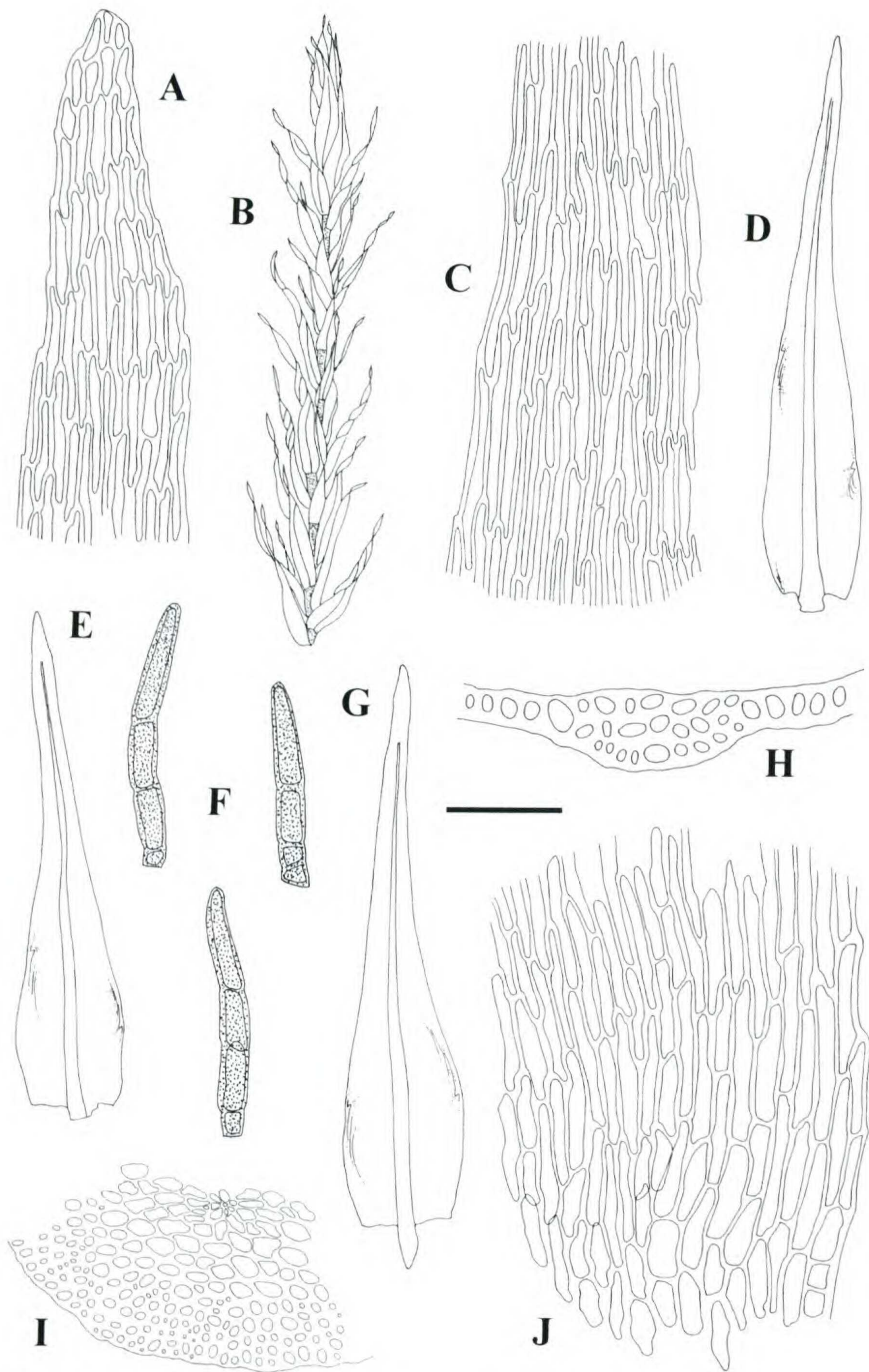


Figure 1. *Leptodictyum wallacei* B. H. Allen & Magill. —A. Leaf apex and upper leaf cells. —B. Habit. —C. Median leaf margin and median leaf cells. —D, E & G. Leaves. —F. Axillary hairs. —H. Costa in cross section, lower part of leaf. —I. Stem in cross section. —J. Basal leaf margin and basal leaf cells. Scale in mm: bar = 0.04 (F, H); bar = 0.06 (A, C, J); bar = 0.08 (I); bar = 0.5 (D, E, G); bar = 1.56 (B).

little stem/branch leaf differentiation. When wet, the leaves of *L. wallacei* are concave and evenly spaced on the stems. The dry plants have a stiff aspect, and the leaves are individually, strongly spirally twisted. The leaves of *L. wallacei* are rounded at the apex, obscurely serrulate throughout, have remarkably long, narrow leaf cells (length:width ratio up to 20:1), and a thick costa that can be 70 μm broad at base.

William Buck (NY) examined this collection, and on the basis of its very broad costa and aquatic habit suggested it could be placed in the genus *Hygroamblystegium* Loeske. This is where we initially concluded it should be placed. However, the exceptionally long, narrow leaf cells and complete absence of alar cell development in this specimen appears to undermine this view. Lars Hedenäs (S) also examined the collection, and in his opinion this moss represents an aberrant form of *Leptodictyum riparium* (Hedwig) Warnstorf. Bernard Goffinet and Alain Vanderpoorten (CONN), on the basis of preliminary molecular analysis, are also of the view that this species is best placed in *Leptodictyum* (Schimper) Warnstorf.

There is in the Interior Highlands of North America a very odd expression of *Leptodictyum riparium* which has been described several times. This odd expression (the *laxirete*-expression of Crum & Anderson, 1981) often grows submerged in slow-moving streams or in springs. In the field, plants of the *laxirete*-expression have the size and

aspect of *Fontinalis* Hedwig. Its leaves are often concave, evenly distributed around the stem, and commonly rounded at the apex, which can be twisted when dry. The leaf margins can be obscurely serrulate, the costa is relatively thick, and the long, narrow leaf cells are up to 15:1 (length:width). Plants of *L. riparium laxirete*-expression are lax and fairly large in size, and they differ from typical *L. riparium* in having entirely red axillary hairs (see Allen, *Fontinalaceae Exsiccatae* 5, MO). The axillary hairs in *L. riparium* have one or two red basal cells, but otherwise the cells are hyaline (see Migula, *Cryptogamae Germaniae, Austriae et Helvetiae* 401, MO). The plants from Hext Spring, Texas, share many features with the *laxirete*-expression of *L. riparium*, including having entirely red axillary hairs. Although the two taxa are morphologically similar, the Hext Spring plants are here recognized as a new species on the basis of their smaller size, stiff stems and leaves that have longer cells, firm-walled basal cells, and undifferentiated alar cells. Many of the features noted above are prone to plasticity when they occur in aquatic mosses. Nevertheless, our extensive field experience with the *laxirete*-expression of *L. riparium* in Missouri and Arkansas indicates it never exhibits the distinctive suite of features that characterizes *L. wallacei*.

Literature Cited

- Crum, H. A. & L. E. Anderson. 1981. Mosses of Eastern North America. Columbia Univ. Press, New York.